

Osmium isotope determination utilizing Nu TIMS Zoom Optics

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Stable osmium (Os) isotopes are often used to understand geological processes including planetary formation, ore- genesis and weathering.

Negative thermal ionization mass spectrometry (N-TIMS) has been successfully adopted for high precision Os isotopic determination over the years. Os isotopes are measured as OsO_3^- with a considerable ionization efficiency [1].

The Nu TIMS instrument, equipped with 16 Faraday detectors and a variable zoom optics system, allows multiple static measurement of all Os isotopes. This will minimize any effects from pre-amplifier gain whilst also providing a host of information on possible interferences.

In this study, the DROs standard has been measured in load sizes varying between 2-50ng using faraday detectors, and 500pg using multiple ion counters. The negative OsO_3^- ions were generated using a single platinum filament and Barium hydroxide coating to help enhance ion emission. An oxygen bleed valve was used to help promote a stable emission.

The external reproducibilities of 22ppm (2RSD) for $^{186}\text{Os}/^{188}\text{Os}$ and 12ppm (2RSD) for $^{187}\text{Os}/^{188}\text{Os}$ ratios achieved in this study demonstrate the capability of Nu TIMS in high precision isotope determination of low level Os.

[1] Schoenberg et al. (2000) *International Journal of Mass Spectrometry* **197**, 85–94